

## REMARKS

Claims 1-5, 7-11, 13-16 and 18-20 are pending in the application.

### I. THE CLAIM AMENDMENTS

The application specification describes at least two alternative imaging spectrometer embodiments, shown in Figure 1 and Figure 2 respectively. Claim 1 is amended above to direct it to a spectrometer in which the received image is divided into four or more spatially separated images. This feature is derived from original claim 12, which has now been deleted. Reference to an input optical retardation element has now been removed from claim 1 – this feature was derived from original claim 6, and so was not present in claim 1 as originally filed. Claim 1 now defines the imager as containing “at least three image replication stages”. The term “image replication stage” has been introduced to provide consistency of terminology between claims 2 to 8 (relating to the Figure 1 embodiment) and claims 9 to 11 (relating to the Figure 2 embodiment), and the polarising beam splitter of each stage is now defined as being a Wollaston prism. This claim feature finds support in the specification at Figure 1 and Figure 2 which are described as possessing image replicating optics which comprise “a first Wollaston prism, ... a second Wollaston prism (and) ... a third Wollaston prism” (see page 7, lines 13-18 and page 10, lines 1-7). Claim 1 further states that light forming each spectral image passes through the polarising beam splitter of each image replication stage – support for this feature is found at page 7, lines 20-28 for the Figure 1 embodiment, and at page 10, lines 23-28 for the Figure 2 embodiment.

Claims 2 and 5 have been amended for consistency with new claim 1, and claims 3 and 4 have been amended for better consistency with claim 2. Claim 6 stands deleted and has not been reintroduced, but the feature of original claim 6, which has now been removed from claim 1, has been added into claim 7. A minor correction has been made to the language of claim 8.

Claim 9 has been amended for consistency with new claim 1. Claims 12 and 17 are redundant and have now been deleted. Claim 20 has been amended for consistency with new claim 1.

In limiting claim 1 (and new claim 20) by the feature of claim 6, protection was limited to only one of the at least two specific embodiments described in the specification. The Applicant

reserves the right to pursue the patenting of other application embodiments in one or more continuing applications.

No new matter is added to the application by way of these claim amendments.

## **II. THE CLAIM 7 REJECTION**

The examiner rejected claim 7 for being dependent upon a cancelled claim.

This rejection is overcome by amending claim 7 above to depend upon claim 2.

## **III. THE ANTICIPATION REJECTIONS**

The examiner has rejected application claims for being anticipated by either Greivenkamp or by Padgett. In order for a reference to anticipate, the reference must show the same invention in as complete a detail as claimed. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Moreover, the elements must be arranged in the reference as required by the claim. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). The examiner's anticipation rejections are traversed at least because the cited prior art does not "show" the claimed invention.

### **A. Traverse of the Greivenkamp Anticipation Rejection**

The examiner rejected claims 1-2, 4-6, 9-14, and 20 for being anticipated by Greivenkamp (USP 4,575,193).

As an initial matter, the examiner's rejection is believed to be moot because claim 1 is amended above to include the features of claim 17, which has not been rejected for being anticipated by Greivenkamp.

In addition independent claims 1 and 20 are novel because Greivenkamp does not disclose the use of polarizing beam splitters that are Wollaston prisms. This is significant, as the action of a Wollaston prism in splitting light of different polarisations into significantly divergent beams is important in the production of discrete images. In Greivenkamp, imaging is not discussed. Rather what is discussed are single spot outputs. (See Figures 2b, 5b, 6b, 7b, 9b and 12b of Greivenkamp for illustration of this). The purpose of Greivenkamp is to adjust the spatial frequency of the green component of an image to match the greater sensitivity of the detector to green – this is anti-aliasing, as discussed in Greivenkamp at col. 2 lines 6 to 19. This does not

involve the production of discrete images (with different spectral characteristics or otherwise) – it involves altering the properties of a single image, in this case by decreasing the spatial frequency of a green component, in order to prevent aliasing errors such as Moire fringes. Thus one skilled in the art at the time of the invention would not understand Greivenkamp to be directed to the production of discrete images. The use of Wollaston prisms as claimed, rather than a very weakly diverging birefringent device, would not be appropriate where the intention is to manipulate the properties of a single image as in Greivenkamp. The arrangement of Greivenkamp thus neither teaches nor suggests the present invention as claimed.

Claims 1 and 20 are also novel because Greivenkamp does not disclose an imaging spectrometer. This is a significant limitation because in order to anticipate, a reference must disclose the claimed elements arranged as claimed. The claimed elements are claimed arranged as a spectrometer. As noted in Applicant's prior amendments, Greivenkamp does not disclose an imaging spectrometer. By default, therefore, Greivenkamp does not disclose the claimed elements arranged as claimed.

Independent claims 1 and 20 and their dependent claims 2, 4-6, 9-11, 13-14, and 20 are novel and non-obvious over Greivenkamp for at least each of the reasons recited above.

#### **B. Traverse Of The Padgett Anticipation Rejection**

Claims 1, 9, 17-18 and 20 stand rejected for being anticipated by Padgett (USP 5,781,293).

As with Greivenkamp above, Padgett does not disclose an imaging spectrometer as the output is not images with particular spectral characteristics but interferograms (as represented, for example, as the trace shown to the right of the detector array in Figures 5, 6, 8 and 11 of Padgett). The power spectrum of the Fourier transform of the interferogram corresponds to the spectral distribution of the input light. The output is an interferogram, and not a spectral image or plurality of spectral images. Therefore, Padgett does not disclose the claimed elements arranged as an imaging spectrometer as claimed and claims 1, 9, 17-18 and 20 are novel and patentable in view of Padgett.

In addition, claims 1, 9, 17-18 and 20 are novel because Padgett does not comprise four or more spatially separated images. The individual elements of the Padgett spectrometer do not produce the functions of the elements of the spectrometer as claimed in the present invention.

The first Wollaston prism of Padgett splits input light from an extended source, which is then recombined through the second Wollaston prism to form an interferogram. Neither Wollaston prism acts to replicate an image, so neither can be considered an image replication stage. There are only two “stages” of any kind in Padgett, and no reason – for the purposes indicated in Padgett – to introduce any further “stages”. For all these reasons, Padgett neither teaches nor suggests the invention in any way.

#### **IV. THE OBVIOUSNESS REJECTION IS MOOT**

The examiner rejected claims 3, 15-16 and 19 for obviousness in view of Greivenkamp in view of “well known practices in the art.” Claims 3, 15-16 and 19 are non-obvious and patentable by virtue of their dependence upon either claims 1 or 20 which are novel and non-obvious for at least the reasons recited in section III above. Moreover, the Applicant disputes that the elements that the examiner takes “Official Notice” of in the obviousness rejection are well within the knowledge of one of ordinary skill in the art. The Applicant reserves the right to dispute the examiner’s Official Notice positions should the examiner raise them again in a subsequent Office Action.

#### **CONCLUSION**

Claims 1-5, 7-11, 13-16 and 18-20 are patentable over the cited prior art for the reasons indicted above. Favorable reconsideration and allowance of all pending application claims is, therefore, courteously solicited.

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